

APPENDIX A

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c A model of a ringdown signal with noise is created to mimic
c experimental data obtained from
c a photodector and preamplifier applied to an A to D convertor.
c It is then fit with the new algorithm that subtracts a line
c that is fit to the background before applying the standard
c algorithm and compares that fit with one that simply uses a
c constant for baseline subtraction. We use exponential decays
c of tau=80 microseconds, choose a peak signal, add gaussian noise,
c add a dc offset then add sixty Hz noise. As in real experiments
c the data is sampled every microsecond.
c Then use one iteration of nonlinear fit and compare.

c ( Note: Fortran 77, with a few exceptions, is used. One exception
c which is machine specific is the open statement. As an example open
c (39,file='',status='new'). The file name which is left
c blank allows its insertion at run time.) The text that follows an "!" is
c a comment and not part of the source code.

c program model

implicit none
integer iy,i,max,k,j,jmax,jj,max2,flag
parameter(k=2000,jj=500) ! k= number of data pts sampled in
c microseconds, jj= number of repeats to form ensemble
real*8 s(k),av(jj),amp,offst,ac,avtau0,x,ava,d,ss0,ss1,y
real*8 s2(k),s3(k),m,b,chisq(jj),sum1,sum2,sum3,sumt,sumt0,bb,mmm
real*8 sum4,sum5,t,a(jj),sigma,tau0(jj),sigmat0,dum,z,sigmaa,gamp
real*4 urand,ss
external function urand

write(*,*) 'pick an integer for random number generator seed'

read(*,*) iy

flag=0 ! flag = 0 uses new algorithm, flag = 1 uses old

c get the data choose added 60hz noise etc.
print*, 'Enter the Gaussian white noise sdev in milivolts'
read(*,*) gamp
print*, 'Enter signal amplitude'
read(*,*) amp
print*, 'Enter 60 Hz rms level'
read(*,*) ac
print*, 'Enter the DC offset voltage'
read(*,*) offst

t=80.d0           ! decay time

write(*,*) ' Name a result file'
open (39,file='',status='new')
write(39,*) 'The chosen values are:'
write(39,*) ' random seed =',iy,', amp =',real(amp),'60Hz-rms =',
*real(ac),'offset =',real(offst),'tau =',real(t)
write(39,*) ' tau      Amp      num points  sigma      reduced chisq
*sigma-tau   sigma-amp   element num'
write(39,*) '
ac=dsqrt(2.d0)*ac ! convert to amplitude,we entered rms value
550  continue
j=0
500  continue

j=1+j

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call getdata(offst,t,amp,ac,gamp,iy,s(1)) !produce the model data

c we want to fit the record s to the exponential, first using a weighted log transformation.
c-----
c----- get average value for the last 100 pts of each decay for base line determination.
c For these points signal has fallen many orders of magnitude below the noise.
      av(j)=0.d0
      do 35 i=k-99,k
         av(j)=av(j)+s(i)
35      continue
         av(j)=av(j)/100.d0

c-----
c----- subtract base line from the data and find sigma from last 100 pts
      sigma=0.d0
      do 45 i=1,k
         s2(i)=s(i)-av(j)
         if (i.ge.k-99)then
            sigma=sigma+(s(i)-av(j))**2
         endif
45      continue
      sigma=sigma/(100.d0-1.d0) ! calculate sigma from baseline fluctuation
      sigma=sqrt(sigma)
c-----
c----- check for values of data below 1 sigma to obtain max ,highest numbered positive
c----- non zero point

      i=1
      while (s2(i).ge.1.d0*sigma)
         max=i-1
         i=i+1
      enddo

c----- if (flag.eq.1) goto 560 ! skip line fitting and subtraction if done once
c-----
c----- fit straight line to data and subtract line from function rather than just a
c----- constant

      if (k-2*max.le.200) then
         max2=200
      else ! begin data for line at twice the time that exponential reaches noise
         max2=2*max ! at this point signal is as far below noise as it was above
                     !the noise initially.
      endif           ! but use no less than 200 pts for fit.

c----- algorithm for straight line fit  x -> i, y -> s(i) y=(mmm)x+bb

      sum1=0.d0
      sum2=0.d0
      sum3=0.d0
      sum4=0.d0

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do 52 i=max2,k
sum1=sum1+s(i)           ! sum(y)
sum2=sum2+i               ! sum(x)
sum3=sum3+i**2            ! sum (x^2)
sum4=sum4+i*s(i)          ! sum (xy)
52 continue
c Npt's=(k- max2+1)
d=(k- max2+1)*sum3-sum2**2
if (d.eq.0.d0) then
print*, 'singular solution' ! make sure program doesn't crash if no solution
pause
endif
mmm=((k- max2+1)*sum4-sum1*sum2)/d ! slope
bb=(sum3*sum1-sum2*sum4)/d      ! intercept
c-----
c now subtract line from the initial data
do 54 i=1,k
s2(i)=s(i)-bb-i*mmm ! line y = mmmx +bb
54 continue

i=1
while (s2(i).ge.1.d0*sigma) ! find maximum value of i for log fit
max=i-1
i=i+1
enddo
c-----
560 continue
c now do log transform and calculate slope, and intercept of line with weighted
c average
c
c
do 60 i=1,max
s3(i)=dlog(s2(i)) ! convert to log of function
60 continue

sum1=0.d0
sum2=0.d0
sum3=0.d0
sum4=0.d0
sum5=0.d0

do 65 i=1,max      ! w=weight = prelog y^2/sigma^2 = s2(i)^2/sigma^2
sum1=sum1+s2(i)**2 ! sum( w) common factor sigma^2 taken out from all terms
sum2=sum2+i*s2(i)**2 ! sum(w*x)
sum3=sum3+s2(i)**2*s3(i) ! sum (w*y)
sum4=sum4+i**2*s2(i)**2 ! sum (x^2*w)
sum5=sum5+i*s2(i)**2*s3(i) ! sum w*x*y
65 continue

m=(sum1*sum5-sum3*sum2)/(sum1*sum4-sum2**2)
b=(sum3/sum1)-(m*sum2/sum1)
c-----
c Also calculate reduced average chisq and sigma tau, see Bevington
chisq(j)=0.d0
do 75 i=1,max
chisq(j)= chisq(j)+(s2(i)-dexp(b)*dexp(m*i))**2/((max-2)*(sigma**2))
75 continue
c-----
tau0(j)=-1.d0/m ! convert from rate to tau

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a(j)=dexp(b)
x=sigma*t**2*dsqrt(sum1/(sum1*sum4-sum2**2)) ! from Bevington ,sigma t
y=sigma*a(j)*dsqrt(sum4/(sum1*sum4-sum2**2)) ! page 108-9,sigma amp
c-----
      write (39,*) real(tau0(j)),real(a(j)),',',max,
*' ,real(sigma),' ',real(chisq(j)),',',real(x),' ',real(y),',',j
      jmax=j

      if (j.ge.jj) goto 100
      goto 500          ! get new data to develop new ringdown for the ensemble
100    continue

c-----
c      calculate ensemble averages

      sumt0=0.d0
      dum=0.d0
      sumt=0.d0

      do 120 j=1 , jmax !find average tau's, av's , a's, and chisq's
      sumt=sumt+a(j)
      sumt0=sumt0+tau0(j)
      dum=dum+chisq(j)
120    continue
      dum=dum/jmax ! average chisq

      avtau0=sumt0/jmax
      ava=sumt/jmax

      sigmaa=0.d0
      sigmat0=0.d0
      do 130 j=1,jmax           !find sigma tau and sigma amp
      sigmat0=sigmat0+(tau0(j)-avtau0)**2
      sigmaa=sigmaa+(ava-a(j))**2
130    continue
      sigmaa=dsqrt(sigmaa/(jmax-1))
      sigmat0=dsqrt(sigmat0/(jmax-1))
      if(flag.eq.0) ss0=sigmat0
      if(flag.eq.1) ss1=sigmat0
      if(flag.eq.1) ss=real(ss1/ss0)
      write(39,*) 'average tau = ', real(avtau0), ' sigma tau = ',
*real(sigmat0), 'average red chisq = ',real(dum)
      write(39,*) 'average amp = ',real(ava), ' sigma amp = ',real(sigmaa)
      if (flag.eq.0) then
        flag=1 ! We now do it all over again using the simple constant baseline subtraction.
        write(39,*) ''
        write(39,*) 'These next results just subtract a constant and not a line to fit'
        write(39,*) ''

      z=urand(iy+17) ! call a random number with a new seed to cause sequence to reset
      c      when iy is used again
      c
      c      This insures that the data used the second time around will be identical to that used in
      c      the first fit.
      c      In that way the comparison is exact between the two algorithms
      c
      goto 550

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        endif
write(39,*) ' the squared ratio of sigma tau for the two data sets = ', ss**2
close(39)

end

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```
subroutine getdata(offst,t,amp,ac,gamp,iy,s)
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```
c
c Given the parameters for the dc offset, decay time, signal amplitude, 60 hz.
c amplitude, rms
c random gaussian noise, and random number seed, returns an array S(k) that represents
c the ringdown voltage.
c
c
```

```

implicit none
integer iy,istat,i,k
parameter(k=2000)
real*8 offst,t,amp,ac,phi,gamp
real*8 s(k),g(k),n0(k),y(k)
real*4 gasdev,urand
external function urand
external function gasdev
phi=dreal(urand(iy)*6.28) !the random phase of the 60Hz signal,a number between 0 and 2pi
do 15 i=1,k
g(i)=gamp*dreal(gasdev(iy))!gaussian noise sd=1,avg value =0 ,for k micro sec
y(i)=amp*dexp(-dreal(i)/t)+ offst
n0(i)=ac*dsin(0.000377d0*i+phi) ! sixty cycle with random phase for each ensemble member
s(i)=g(i)+y(i)+n0(i)
15 continue
return
end
```

```
function gasdev(iy)
```

```
c
c generate normal gaussian random numbers sd=1 avg =0 (From "Numerical Recipes",Press et. al
c Cambridge University Press 1986)
c
external function urand
real*4 urand,v1,v2,gasdev,gset,fac,r
integer*4 iset,iy
data iset/0/
1 if (iset.eq.0) then
v1=2.*urand(iy)-1.
v2=2.*urand(iy)-1.
r=v1**2+v2**2
if(r.ge.1.)go to 1
fac=sqrt(-2.*log(r)/r)
gset=v1*fac
gasdev=v2*fac
iset=1
else
gasdev=gset
iset=0
endif
return
end
```

```
real function urand(iy)
c
c   Finds a psuedo random number.
c   the integer iy should be initialized to an arbitrary integer prior to the fist call
c   to urand. the calling program should not alter the value of iy between subsequent
c   calls to urand. values are returned between 0 and 1.
c
c   integer ia,ic,itwo,m2,m,mic
c   double precision halfm
c   real s
c   double precision datan,dsqrt
c   data m2/0/,itwo/2/
c   if(m2.ne.0) go to 20
c
c   if first reentry compute machine integer word length
c
c   m=1
10  m2=m
    m=itwo*m2
    if (m.gt.m2) go to 10
    halfm=m2
c
c   ia=8*idint(halfm*datan(1.d0)/8.d0)+5
c   ic=2*idint(halfm*(0.5d0-dsqrt(3.d0)/6.d0))+1
c   mic=(m2-ic)+m2
c
c   s is a scale factor for converting to floating point
c
c   s=0.5/halfm
c
c   compute next random number
c
20  iy=iy*ia
    if (iy.gt.mic) iy=(iy-m2)-m2
    iy=iy+ic
    if(iy/2.gt.m2) iy=(iy-m2)-m2
    if(iy.lt.0) iy=(iy+m2)+m2
    urand=float(iy)*s
    return
end
```

APPENDIX B

This is the compiled results using 500 independent ringdowns with the rms 60 Hz = to the gaussian rms white noise. As you can see, as indicated at the bottom of the table, the squared ratio of the ensemble sigma tau is 19.77. That ratio shows that to achieve a given precision in tau, one needs 19.77 times as much averaging using the standard algorithm compared with the new one. We have repeated this run 10 times to develop a statistic on the improvement for this set of parameters and the result was that the average improvement was 18.98 with a sdev = 1.42. As you might expect, if the 60 Hz signal gets smaller, the improvement also gets smaller. However, the significance of the result is that the time taken to make a measurement of a given precision is reduced by that ratio.
 (This is the output of the source code with one item that I added subsequently , the "gauss rms = 3.5").

The chosen values are:

tau	Amp	num points	sigma	reduced chisq	sigma-tau	sigma-amp	element num
80.3812	799.880	377	3.41363	1.06457	0.108180	0.771510	1
80.0478	800.545	370	3.47633	1.11195	0.110807	0.787399	2
80.5942	797.733	357	3.56602	0.901096	0.113038	0.805365	3
79.7959	800.223	364	3.47949	0.935880	0.112026	0.791412	4
80.2757	799.792	343	3.85445	0.910839	0.122796	0.872772	5
79.7136	800.013	356	3.64096	0.903653	0.117230	0.827762	6
80.1079	799.414	328	3.66295	0.902719	0.117561	0.831779	7
80.4085	798.814	369	3.40928	1.09774	0.108281	0.770851	8
79.9620	798.997	354	3.46550	0.919112	0.111112	0.786289	9
79.9450	799.908	339	3.58053	0.859031	0.115175	0.814045	10
80.5768	799.571	369	3.49413	0.977574	0.110215	0.788068	11
80.3235	799.982	367	3.42647	1.11993	0.108919	0.775385	12
80.1065	799.776	364	3.68315	0.979039	0.117587	0.834578	13
79.8826	797.612	355	3.67865	0.896638	0.118441	0.835436	14
80.1940	800.994	342	3.32195	1.16005	0.105765	0.752381	15
80.1189	799.735	368	3.66811	0.845112	0.117201	0.831674	16
80.2248	797.985	370	3.66111	0.990751	0.116966	0.829375	17
80.2534	798.529	337	3.09522	1.33661	9.911115E-02	0.702039	18
80.6539	798.334	377	3.34951	1.02779	0.105757	0.755472	19
80.0661	798.940	352	3.36445	1.05537	0.107878	0.763572	20
80.1926	799.261	344	3.70351	0.957610	0.118209	0.838947	21
79.7549	800.642	390	3.43053	0.941505	0.109912	0.778532	22
79.9710	799.103	360	3.16224	1.03390	0.101494	0.717973	23
80.2389	799.133	352	3.70208	0.869751	0.118023	0.838264	24
80.3320	799.336	362	3.48165	0.898230	0.110457	0.786854	25
80.0478	799.761	357	3.55346	0.874637	0.113643	0.805859	26
80.1229	801.448	358	3.57680	0.925075	0.113715	0.809729	27
79.8343	799.408	362	3.52717	0.915940	0.113437	0.801489	28
80.4072	800.646	345	3.23790	1.24147	0.102770	0.732525	29
80.2135	798.802	362	3.46311	1.02765	0.110439	0.784080	30
79.9797	798.023	347	3.59251	0.993194	0.115368	0.815205	31
80.0015	800.016	335	3.17675	1.31002	0.101899	0.721247	32
80.2739	799.292	370	2.80468	1.36614	8.940282E-02	0.635305	33
80.2325	799.895	355	3.18023	1.28376	0.101511	0.720895	34
80.1239	799.947	357	4.01733	0.783859	0.128420	0.911108	35
80.3681	798.786	359	3.29321	1.11531	0.104797	0.745206	36
80.1854	797.797	345	3.85224	0.710844	0.123417	0.873547	37
80.4123	799.192	352	3.47029	1.01612	0.110295	0.784959	38
80.0014	799.991	384	3.18610	1.05959	0.101856	0.722510	39
80.1084	799.812	348	3.39072	1.05840	0.108519	0.769263	40
80.1952	800.702	354	3.52682	1.07649	0.112333	0.798850	41
80.3925	798.095	353	3.50967	0.866208	0.111681	0.793859	42
80.0717	798.897	354	3.22297	1.40809	0.103220	0.730957	43

80.0652	799.503	361	3.01224	1.36238	9.651958E-02	0.683667	44
79.9924	799.581	348	3.52276	0.902304	0.113262	0.800741	45
80.2594	799.905	360	3.80231	0.832782	0.120938	0.860455	46
79.8885	798.848	360	3.34321	1.14142	0.107473	0.759256	47
79.7865	799.934	362	3.80141	0.846560	0.122173	0.863599	48
80.0431	798.649	356	3.69423	0.826237	0.118471	0.838282	49
80.1002	798.542	357	3.65684	1.00040	0.117087	0.829213	50
80.1506	799.860	350	3.42042	1.25200	0.109397	0.775831	51
79.8712	799.471	368	3.43632	0.969244	0.109895	0.778789	52
80.2386	800.389	373	3.52289	1.00298	0.111996	0.797288	53
80.6664	800.708	376	3.45900	0.982347	0.108635	0.779197	54
80.2141	799.533	354	3.50310	1.00037	0.111651	0.793270	55
80.1684	799.886	376	3.57510	0.800629	0.113680	0.808862	56
79.8979	798.265	379	3.53829	0.979120	0.113534	0.802698	57
79.8790	801.421	328	3.56524	1.12472	0.114764	0.811164	58
80.0871	800.029	354	3.43421	0.927179	0.109803	0.778901	59
80.2119	798.231	367	3.36987	1.23473	0.107429	0.762613	60
79.8350	798.362	366	3.41828	0.922450	0.109908	0.776138	61
79.7611	798.936	358	3.38721	1.12772	0.109312	0.770527	62
80.0349	800.326	341	3.67013	0.884792	0.117623	0.833229	63
80.2091	798.672	350	3.45391	1.06840	0.110298	0.782376	64
80.1261	798.263	354	3.90308	0.721050	0.124728	0.884100	65
79.8974	797.609	363	3.26460	1.20106	0.105494	0.742836	66
80.2315	800.633	383	3.38483	0.997836	0.107483	0.765750	67
80.2131	800.280	345	3.77116	0.829861	0.120007	0.853593	68
80.3054	800.356	357	3.35922	1.16718	0.106775	0.760220	69
80.2076	800.663	360	3.49159	0.919786	0.111174	0.790863	70
80.0741	799.734	345	3.46358	0.924962	0.110818	0.785567	71
80.2760	799.886	348	3.01993	1.25448	9.640564E-02	0.684668	72
80.0766	799.373	359	3.71413	0.868135	0.118555	0.841234	73
80.0755	799.098	365	3.93837	0.774420	0.125897	0.892612	74
80.1813	798.997	350	3.57193	1.00185	0.114276	0.809983	75
79.9586	800.785	336	3.40085	1.07883	0.109255	0.773020	76
79.9223	798.486	364	3.99356	0.774810	0.128520	0.907451	77
79.8370	800.414	354	3.59938	0.967544	0.115503	0.817369	78
79.9985	799.242	345	3.15828	1.16751	0.101429	0.717248	79
79.8424	799.157	378	3.46142	0.939634	0.111214	0.786120	80
80.1373	799.180	334	3.48600	1.06180	0.111925	0.791741	81
79.9770	799.289	369	3.49498	0.928750	0.111829	0.792391	82
80.0688	799.486	339	3.55179	0.957820	0.113815	0.805925	83
79.9244	798.796	361	3.26039	1.01545	0.105022	0.741353	84
79.9133	800.601	363	3.09048	1.28334	9.904207E-02	0.701632	85
80.3574	798.826	391	3.26436	1.12227	0.103562	0.737654	86
79.9560	799.151	357	3.51752	0.918528	0.112976	0.798859	87
80.1137	799.516	364	3.73919	0.776793	0.119225	0.846694	88
79.8712	800.466	326	3.26240	1.17546	0.105307	0.742847	89
80.0680	796.866	352	3.40169	1.08475	0.109339	0.771881	90
80.2709	799.014	361	3.07152	1.53299	9.801567E-02	0.695808	91
80.2308	800.036	347	3.41803	1.14087	0.108957	0.774247	92
79.9246	800.339	345	3.97266	0.789615	0.127333	0.901747	93
80.0817	800.167	371	3.21134	1.13721	0.102573	0.728102	94
79.9947	799.475	348	3.30803	1.03446	0.105975	0.750462	95
80.4134	800.011	356	3.68386	0.878181	0.116878	0.833110	96
80.0226	799.876	346	3.55499	0.937570	0.114267	0.808091	97
80.1604	798.492	347	3.40213	1.01279	0.108825	0.771101	98
80.3452	799.875	339	3.32803	1.03109	0.105995	0.753671	99
80.4588	799.408	385	2.86372	1.34531	9.065109E-02	0.646828	100
80.0893	799.326	350	3.50891	0.923845	0.112378	0.796133	101
80.3195	800.418	376	3.37414	1.18182	0.107061	0.763036	102
79.8173	799.289	345	3.28836	1.21588	0.105845	0.747181	103
80.0080	799.184	356	4.03239	0.735519	0.129290	0.915096	104
80.2417	798.588	363	3.41678	0.963055	0.109134	0.774241	105
80.4613	797.833	371	3.35658	1.09554	0.106599	0.758522	106

80.1971	800.698	362	3.97213	0.673680	0.126390	0.899484	107
79.9672	799.552	375	4.04755	0.711646	0.129491	0.917804	108
79.8965	799.946	373	3.49178	0.948453	0.111878	0.792331	109
80.1013	799.490	338	3.63289	0.985934	0.116528	0.824854	110
80.1379	798.471	355	3.45349	1.04479	0.110547	0.783037	111
80.1547	798.559	354	3.43704	0.998915	0.109979	0.779259	112
80.0013	799.403	336	4.15877	0.781624	0.133604	0.944548	113
80.4955	799.609	354	3.50197	0.998408	0.111226	0.792327	114
80.0807	800.930	362	3.29082	1.11158	0.104911	0.745734	115
80.2495	799.089	357	3.24327	1.24364	0.103463	0.734632	116
80.3853	798.861	361	3.41634	1.07044	0.108625	0.772792	117
80.2917	799.447	361	3.35988	0.983118	0.107280	0.761737	118
80.3936	799.282	373	3.35197	1.15466	0.106351	0.757648	119
80.2886	799.091	370	3.37531	0.963922	0.107588	0.764457	120
80.1945	798.672	354	3.40903	1.11263	0.108916	0.772433	121
79.9855	797.691	363	3.25762	1.07966	0.104453	0.738610	122
80.0114	798.950	364	3.87417	0.760721	0.123927	0.878184	123
80.3063	799.627	361	3.37160	1.14493	0.107260	0.763041	124
80.3963	798.248	334	3.44604	1.06082	0.110018	0.780571	125
79.9459	798.613	355	3.29820	1.09109	0.106162	0.749562	126
80.3398	799.468	356	3.50939	0.875796	0.111616	0.794138	127
79.8753	800.949	337	3.82977	0.849377	0.122967	0.870165	128
80.2055	799.901	363	3.62650	0.821042	0.115635	0.821681	129
79.9158	798.811	333	4.00005	0.696884	0.128998	0.909737	130
80.1227	799.700	361	3.49760	0.958397	0.111757	0.792952	131
80.4232	798.802	375	3.61614	0.908066	0.114433	0.816138	132
79.9672	801.494	356	4.19179	0.727101	0.133900	0.950719	133
79.8098	799.278	368	3.09071	1.32669	9.959607E-02	0.702869	134
79.7279	799.992	351	3.63781	1.02074	0.117480	0.828212	135
80.1007	799.480	354	3.63860	0.935682	0.116372	0.825082	136
80.0743	799.763	356	3.38292	1.11374	0.108107	0.766845	137
79.9504	800.408	344	3.29516	1.19130	0.105906	0.749065	138
80.0445	798.414	348	3.65670	0.970489	0.117435	0.830167	139
80.0036	799.960	355	3.04643	1.14110	9.761681E-02	0.691533	140
80.3137	800.907	349	3.20712	1.21511	0.102086	0.726563	141
80.2524	799.153	350	3.10875	1.22172	9.929992E-02	0.704628	142
79.8423	799.015	350	3.80241	0.824126	0.122436	0.864269	143
79.8642	799.948	354	3.81213	0.797688	0.122506	0.866140	144
79.9651	800.733	352	3.35303	1.06354	0.106993	0.759766	145
80.0994	798.904	344	3.65192	0.855422	0.117070	0.828710	146
80.5483	798.484	348	3.52869	1.01567	0.112164	0.798163	147
80.3092	798.600	351	3.57378	1.04651	0.113973	0.809217	148
80.1074	799.673	372	3.01788	1.41932	9.653959E-02	0.684554	149
79.9506	799.680	362	3.46349	0.948307	0.111125	0.786481	150
79.6785	799.307	333	4.01379	0.662497	0.129991	0.914434	151
80.0217	800.377	339	3.38815	1.10900	0.108575	0.769163	152
80.2539	799.548	358	3.52523	0.852781	0.112204	0.797888	153
80.1468	799.073	336	3.38694	1.13095	0.108360	0.767863	154
80.2278	799.444	346	3.74644	0.813111	0.119554	0.848853	155
80.3125	799.058	361	3.86145	0.712568	0.122736	0.873294	156
80.2915	798.912	353	3.34791	0.992097	0.106633	0.757755	157
79.9882	800.362	363	3.56890	0.902942	0.114174	0.809653	158
80.5235	799.680	378	3.48646	0.985824	0.110167	0.786987	159
79.8685	798.646	362	3.61220	0.867179	0.116064	0.820053	160
79.8287	801.701	349	3.12919	1.16289	0.100470	0.711375	161
79.9150	799.174	337	3.25103	1.17398	0.104653	0.738910	162
80.3207	799.389	380	3.85350	0.858115	0.121924	0.869693	163
80.2104	798.899	342	3.53076	1.11972	0.113106	0.801099	164
80.2187	799.607	340	3.31195	1.02505	0.105881	0.751064	165
80.1014	799.632	354	3.52722	1.03961	0.112591	0.799055	166
80.3281	798.421	367	3.02959	1.37408	9.654789E-02	0.685787	167
80.3572	800.046	371	3.33139	1.14472	0.105752	0.753477	168
80.0293	799.630	325	3.91158	0.745621	0.125918	0.889404	169

80.2242	799.314	361	4.00645	0.796298	0.127985	0.908236	170
80.1216	799.961	360	3.91975	0.740766	0.125019	0.887958	171
80.5222	799.726	369	3.52172	1.12410	0.111441	0.795491	172
80.1881	799.113	358	3.56151	0.962995	0.113503	0.806203	173
80.1267	800.550	352	3.37374	0.937631	0.107643	0.764731	174
80.3625	799.473	352	3.42615	1.07211	0.109085	0.775709	175
80.0912	800.525	336	3.60409	0.947628	0.115103	0.817015	176
79.9588	799.288	358	3.84930	0.819585	0.123536	0.873935	177
79.9985	798.610	363	3.35392	1.10331	0.107686	0.761451	178
80.1925	800.689	373	4.06625	0.827805	0.129127	0.919743	179
80.4065	798.209	362	3.55319	1.06446	0.112951	0.803317	180
79.9635	799.278	373	3.20959	1.19371	0.102698	0.727627	181
80.1160	800.031	367	3.83960	0.837351	0.122659	0.870617	182
80.1397	799.645	341	3.55636	0.879970	0.113769	0.806624	183
79.9520	799.510	353	3.62475	0.901947	0.116337	0.823031	184
80.5369	798.878	379	3.49406	1.04614	0.110462	0.788507	185
80.3356	799.064	369	3.55063	0.860228	0.112727	0.802642	186
80.0562	800.647	344	3.50809	0.985287	0.112134	0.795656	187
79.7510	799.229	348	3.55637	0.823368	0.114781	0.809137	188
80.1875	800.770	338	3.64085	1.00139	0.116126	0.825149	189
80.1365	799.994	343	3.46509	1.03564	0.110499	0.784808	190
80.0227	800.711	346	3.59470	0.943969	0.115111	0.816048	191
79.8800	799.584	361	3.89307	0.827839	0.125185	0.884759	192
79.9505	798.776	356	3.56023	0.975333	0.114576	0.809102	193
80.0684	798.481	362	3.32602	1.21109	0.106693	0.754813	194
80.5123	799.293	347	3.32482	1.10577	0.105447	0.751469	195
79.9467	798.399	355	3.45290	0.936552	0.110983	0.784074	196
80.1921	799.587	357	3.43666	0.944387	0.109471	0.777981	197
80.0604	797.679	354	3.45935	1.08767	0.111126	0.785208	198
80.1976	799.448	360	3.52424	0.836409	0.112484	0.798644	199
79.9503	798.633	366	3.17271	1.17791	0.101864	0.720225	200
80.3002	799.229	339	3.80128	0.911433	0.121300	0.861135	201
79.8856	801.061	348	2.98153	1.50719	9.568289E-02	0.677410	202
79.8446	800.228	347	3.23746	1.24558	0.104115	0.735884	203
80.1638	799.588	350	3.41009	1.15706	0.108943	0.772991	204
80.0468	799.828	330	3.60909	0.868364	0.116142	0.820754	205
79.9912	801.465	371	3.53656	0.968260	0.112639	0.801088	206
80.0607	798.089	346	3.50601	1.01929	0.112581	0.795723	207
79.7555	798.343	349	3.31086	1.31358	0.107087	0.753586	208
80.2013	797.336	348	2.80942	1.53865	8.998625E-02	0.636852	209
80.1236	799.037	363	3.16942	1.30262	0.101306	0.718336	210
80.1172	800.047	353	3.57722	0.930397	0.114175	0.810613	211
80.1367	800.506	348	3.46785	0.988212	0.110754	0.786323	212
80.1690	799.076	345	3.75842	0.908447	0.120420	0.852888	213
80.2654	800.605	338	3.43773	0.898206	0.109652	0.779303	214
79.8936	798.872	319	3.77373	0.923873	0.122176	0.859647	215
79.9508	799.459	355	3.61268	0.796753	0.115817	0.819847	216
80.4873	798.508	332	3.94961	0.768052	0.126016	0.894776	217
80.3746	799.440	365	3.49376	0.916445	0.110892	0.789897	218
79.9239	799.908	360	3.54232	0.965268	0.113455	0.803667	219
80.0974	797.903	350	3.67880	0.968546	0.118025	0.834645	220
80.1883	800.372	367	3.31614	1.06732	0.105531	0.750787	221
79.9621	800.882	377	3.52479	0.943318	0.112252	0.798009	222
79.9954	799.145	360	3.36580	1.14808	0.108044	0.764218	223
80.2519	798.843	361	3.75436	0.826454	0.119236	0.848409	224
80.4390	799.727	340	3.46418	1.06616	0.109927	0.783165	225
80.0357	799.225	339	3.20139	1.13606	0.102852	0.727199	226
80.3948	799.444	371	3.82232	0.840642	0.121476	0.864808	227
80.2717	799.349	367	3.58056	0.981030	0.114067	0.810751	228
80.0780	800.157	356	3.29253	1.15536	0.105216	0.746548	229
80.1913	799.193	367	3.51899	1.13343	0.112016	0.796116	230
80.0578	798.719	319	3.66078	0.965219	0.118090	0.832699	231
80.4753	798.484	359	3.48746	0.906707	0.110773	0.788571	232

80.0214	797.673	383	2.97421	1.32880	9.549629E-02	0.674989	233
80.1266	800.086	352	3.44730	1.01789	0.110191	0.781818	234
80.1023	798.487	357	3.33014	1.01865	0.106547	0.754843	235
80.3082	800.608	375	3.56412	1.04846	0.113124	0.806251	236
80.1828	800.000	368	3.09868	1.37254	9.867508E-02	0.701611	237
80.1891	800.227	359	2.94595	1.54548	9.385164E-02	0.667168	238
80.3105	798.343	334	3.77792	0.839863	0.120691	0.855921	239
79.7822	799.811	344	3.58391	0.884939	0.115595	0.815443	240
80.1136	799.091	343	3.76397	0.900334	0.120527	0.853732	241
79.7719	799.403	356	3.17456	1.16745	0.102384	0.722186	242
79.9987	799.922	365	3.24906	0.953750	0.103822	0.736532	243
79.7523	799.771	363	3.33658	1.13796	0.107744	0.759686	244
80.3514	798.241	359	3.09641	1.29815	9.855807E-02	0.700478	245
79.9489	799.601	362	3.49294	0.767982	0.112081	0.793232	246
80.2906	798.828	325	3.54521	1.07425	0.113695	0.804764	247
80.1758	800.817	360	3.79612	0.981569	0.120695	0.859135	248
80.1410	798.771	361	3.35521	1.16733	0.107332	0.760691	249
80.0189	800.610	334	3.81045	0.860614	0.122194	0.865385	250
80.0550	799.316	345	3.64529	0.918905	0.116977	0.827692	251
80.5289	798.911	360	3.80559	0.941829	0.120612	0.859755	252
79.7483	800.065	345	3.38932	0.886866	0.109169	0.770754	253
80.1120	799.524	346	3.79132	0.891508	0.121558	0.860731	254
79.8844	798.901	352	3.65578	0.889340	0.117930	0.831731	255
80.2116	799.190	369	3.36764	0.959591	0.107524	0.763283	256
80.0020	800.394	374	3.52293	0.986308	0.112309	0.797926	257
79.8608	799.390	334	3.21059	1.17017	0.103352	0.729640	258
79.7669	800.802	355	3.75453	0.812089	0.120583	0.853048	259
79.9965	800.836	367	3.64788	0.851226	0.116370	0.826676	260
80.3855	799.640	340	3.35509	1.01719	0.106586	0.758828	261
80.1080	799.237	365	3.32480	1.16134	0.106063	0.752917	262
80.1787	798.387	362	3.49554	0.978907	0.111749	0.792168	263
79.9191	800.053	346	3.58325	0.963764	0.115295	0.814794	264
79.9919	799.081	373	3.55060	1.04485	0.113948	0.806095	265
79.8530	800.942	339	3.66153	0.844671	0.117664	0.832344	266
80.3191	798.247	373	3.72867	0.791136	0.118661	0.843450	267
80.1877	800.227	371	3.54292	0.939071	0.113077	0.803200	268
80.0612	799.027	352	3.36016	1.16250	0.107734	0.762511	269
80.2392	800.036	331	3.77801	0.936370	0.121013	0.857731	270
80.2934	799.378	359	4.11210	0.825963	0.130989	0.931097	271
79.8614	800.267	347	3.83440	0.822427	0.123190	0.871213	272
80.3193	799.055	373	2.84976	1.45170	9.041621E-02	0.643930	273
80.2289	800.195	367	3.92777	0.706740	0.125120	0.889808	274
80.1711	799.942	342	3.60703	1.00047	0.115453	0.818476	275
80.1858	799.348	355	4.28248	0.768287	0.136613	0.969940	276
80.2100	800.195	369	3.30165	1.09459	0.104886	0.746769	277
79.8926	799.143	354	3.39268	1.03960	0.109121	0.770909	278
79.7170	799.787	371	3.77671	0.846563	0.121820	0.859412	279
80.3400	799.724	350	3.53123	0.998146	0.112433	0.799581	280
80.4015	798.369	335	3.27750	1.04057	0.104545	0.742160	281
79.6615	799.426	363	3.22732	1.15809	0.103969	0.733565	282
80.2074	799.872	385	3.63390	0.923675	0.115652	0.822645	283
80.0367	798.757	371	3.35263	1.08983	0.107494	0.760782	284
80.1911	799.213	348	3.76516	0.957851	0.120591	0.854426	285
80.2145	800.068	357	3.31116	1.18622	0.105521	0.750004	286
80.1323	799.239	379	3.17552	1.12255	0.101116	0.718598	287
79.8382	800.291	368	3.03559	1.16951	9.737249E-02	0.689309	288
80.2356	798.544	347	3.66072	0.885830	0.116784	0.828862	289
80.0945	798.923	357	3.48706	1.05645	0.111857	0.791668	290
80.0110	799.558	369	2.96542	1.34634	9.475092E-02	0.672027	291
80.6194	799.397	364	3.52047	1.07038	0.111158	0.794394	292
79.9727	800.649	341	3.66275	0.951603	0.117563	0.832174	293
79.8694	799.334	371	3.40597	1.11995	0.109281	0.772994	294
80.1243	798.956	348	3.82787	0.853933	0.122396	0.867631	295

80.2320	799.849	362	3.32251	1.00495	0.105629	0.751706	296
79.9541	799.091	335	3.58623	0.940058	0.115504	0.815350	297
80.5141	799.394	374	3.59940	0.869389	0.113819	0.812623	298
80.3180	800.443	370	3.01249	1.36668	9.558456E-02	0.681289	299
80.2349	798.906	357	3.23152	1.10825	0.102984	0.731501	300
79.8969	799.908	338	3.19479	1.21692	0.102733	0.726007	301
79.9611	799.815	350	3.28561	1.22335	0.105778	0.747373	302
80.1455	799.059	349	3.38382	1.02603	0.108425	0.767931	303
80.2687	798.223	360	3.26833	1.22873	0.104377	0.740287	304
80.4335	797.871	368	3.13725	1.31664	9.962207E-02	0.708894	305
80.1618	799.826	371	3.59019	0.829525	0.114441	0.813238	306
79.7843	800.130	363	3.27878	1.22989	0.105595	0.745710	307
80.4255	799.247	382	3.51633	0.999727	0.111352	0.794210	308
79.7663	798.911	365	3.72077	0.982607	0.119830	0.845509	309
80.1315	799.003	339	3.50577	0.914959	0.112581	0.796336	310
80.1809	799.002	364	3.82235	0.860005	0.121936	0.865642	311
80.0692	799.537	358	3.99750	0.752406	0.128102	0.907371	312
79.9168	800.405	356	3.36735	1.05862	0.108084	0.765019	313
80.2365	797.784	344	3.63696	1.01079	0.116386	0.824267	314
80.0403	800.028	339	3.41743	1.00026	0.109361	0.775178	315
79.7818	800.414	349	3.37628	0.927628	0.108593	0.767513	316
79.9932	799.477	363	3.29270	1.17187	0.105392	0.746730	317
80.1598	799.430	350	3.44163	1.06848	0.109928	0.780002	318
80.3103	800.706	374	3.04482	1.26826	9.662925E-02	0.688855	319
79.9746	799.045	357	3.41775	1.04833	0.109706	0.775954	320
80.1462	799.705	360	3.44936	1.02477	0.110170	0.781888	321
80.0312	799.456	334	3.51988	1.02815	0.113090	0.799613	322
79.7713	800.762	339	3.97957	0.777578	0.128472	0.906377	323
80.0656	800.198	351	3.24059	1.14977	0.103498	0.734538	324
80.1575	798.280	346	3.17992	1.10234	0.101856	0.721146	325
79.9717	799.573	355	3.74979	0.796133	0.120273	0.851297	326
79.9725	800.178	351	3.66798	0.939399	0.117654	0.832973	327
80.1080	798.003	357	3.55852	1.02696	0.113956	0.806714	328
80.2302	800.049	350	3.73041	0.811769	0.118957	0.845290	329
80.2790	798.434	371	3.48028	0.992846	0.110702	0.787019	330
80.1773	800.610	363	3.70269	0.812447	0.117643	0.837733	331
79.5729	800.337	357	3.74165	0.903332	0.121079	0.852549	332
79.8220	798.650	351	3.38639	0.912351	0.109165	0.769911	333
79.7722	798.946	376	3.80296	0.810679	0.122105	0.863013	334
80.2137	799.238	342	3.27938	1.32540	0.105033	0.744139	335
80.3178	798.754	392	3.02038	1.17613	9.595641E-02	0.682905	336
80.0791	799.036	348	3.25758	1.04395	0.104406	0.739183	337
80.1724	800.360	367	3.27133	1.12944	0.103788	0.739381	338
80.0888	800.148	350	2.93527	1.32075	9.363855E-02	0.665020	339
80.2422	799.833	358	3.88175	0.844180	0.123577	0.878750	340
80.1032	800.223	368	3.35375	1.16849	0.106783	0.759156	341
79.9701	799.802	358	3.32830	1.21646	0.106766	0.755706	342
79.8264	800.229	328	3.73177	0.822216	0.120297	0.848995	343
80.0588	798.769	359	3.29231	1.23962	0.105486	0.746761	344
80.1169	799.188	335	3.54679	0.974317	0.113768	0.805141	345
79.9036	799.232	345	3.64709	0.850652	0.117266	0.828586	346
79.9834	799.400	336	3.42450	0.966525	0.110036	0.777928	347
79.9824	799.436	343	3.38750	1.10357	0.109000	0.770108	348
79.9873	799.444	333	3.11859	1.27880	0.100322	0.708774	349
80.1256	801.340	346	3.30665	1.10468	0.105359	0.749244	350
79.9415	798.196	356	3.53855	1.07524	0.113832	0.803734	351
80.0344	800.086	359	3.63950	0.950775	0.116276	0.824983	352
79.9225	799.512	370	3.46266	1.00283	0.111130	0.786217	353
80.3933	799.434	367	3.99557	0.740318	0.127072	0.904359	354
80.0678	800.313	348	3.44757	1.06052	0.110198	0.781834	355
80.2690	799.426	352	3.45117	1.01038	0.109871	0.781148	356
80.1471	799.288	332	3.46222	0.974352	0.111051	0.786034	357
80.1126	800.004	359	3.41700	1.03516	0.109378	0.775501	358

79.9546	797.976	335	3.47963	1.03694	0.112401	0.791716	359
80.4118	800.153	377	3.30734	1.06835	0.104757	0.747423	360
79.8575	798.414	359	3.36228	1.20262	0.108229	0.763869	361
80.1348	799.273	360	3.58286	0.916399	0.114395	0.811774	362
80.3758	799.397	376	3.74162	0.815524	0.118531	0.845188	363
80.2070	799.346	346	3.99576	0.832495	0.127633	0.905597	364
80.1250	798.891	359	3.71206	0.944441	0.118469	0.840559	365
80.4524	800.615	361	3.35251	1.13684	0.106232	0.758024	366
80.0618	800.952	358	3.65092	0.935863	0.116571	0.827879	367
80.0072	800.050	374	3.57574	1.00237	0.114189	0.810362	368
79.9386	800.075	358	3.35765	1.04813	0.107634	0.762236	369
80.4202	799.444	353	3.72036	0.955641	0.117910	0.840482	370
79.8046	798.778	335	3.35941	1.24650	0.108571	0.764570	371
80.1398	800.311	365	3.43194	0.919670	0.109436	0.777662	372
80.3780	799.044	340	3.67573	0.918718	0.116984	0.831751	373
80.3284	798.321	394	3.56073	0.882339	0.113156	0.804960	374
79.9756	800.143	379	3.15956	1.20711	0.100840	0.715779	375
80.2038	799.098	337	3.52511	0.993594	0.112948	0.799958	376
80.0852	799.883	349	3.56683	0.949312	0.114085	0.808978	377
79.8975	799.706	332	3.01921	1.36884	9.730848E-02	0.686805	378
80.1020	799.161	366	3.81783	0.872927	0.122132	0.865723	379
80.1719	798.305	357	3.38356	1.05134	0.108194	0.766759	380
80.0311	800.790	360	3.57960	0.948837	0.114108	0.810865	381
80.3950	800.416	373	3.57821	0.913190	0.113475	0.809274	382
79.8624	799.594	349	4.02291	0.764503	0.129239	0.913635	383
80.3636	799.082	381	3.64053	0.962545	0.115628	0.823181	384
80.2556	800.709	359	3.35736	1.03695	0.106850	0.760420	385
80.0802	799.112	349	3.78959	0.865606	0.121280	0.859285	386
79.9879	800.855	344	3.42284	0.961630	0.109738	0.777486	387
80.0551	800.583	349	3.75117	0.918100	0.120088	0.851390	388
80.0499	798.926	371	3.29312	1.11019	0.105566	0.747355	389
80.5232	798.706	347	3.54596	1.13895	0.112555	0.801524	390
80.6066	798.019	362	3.57726	0.905080	0.113156	0.807240	391
80.2148	799.827	320	3.28039	1.26470	0.105013	0.744148	392
80.3317	799.106	369	3.40823	1.09192	0.108401	0.771172	393
79.7541	800.757	364	3.27482	1.20961	0.105227	0.744210	394
80.3165	798.963	359	3.56145	0.882699	0.113531	0.806593	395
80.3761	798.996	358	3.30521	1.22987	0.105082	0.747580	396
80.0748	799.099	369	3.64869	0.856880	0.116733	0.827321	397
80.0518	800.646	374	3.27596	1.10065	0.104299	0.741729	398
80.0525	799.919	371	3.37209	1.15356	0.107698	0.764273	399
80.3326	798.853	314	3.57617	0.885917	0.114754	0.811936	400
80.2955	799.221	370	3.40752	1.06285	0.108177	0.770203	401
80.2223	800.106	374	3.62904	0.898293	0.115107	0.820178	402
80.5095	798.427	367	3.82566	0.891155	0.121382	0.864552	403
80.1957	799.899	361	3.40573	0.985482	0.108380	0.770822	404
79.9865	800.013	348	3.20385	1.30391	0.102939	0.728101	405
80.2670	799.848	350	3.80427	0.815870	0.121494	0.862651	406
80.1606	799.365	370	3.86593	0.765458	0.123460	0.876204	407
79.8929	799.330	342	3.60246	0.997768	0.116248	0.819818	408
80.0438	798.854	332	3.52949	1.02525	0.113498	0.801862	409
79.7378	799.268	346	3.53643	0.931532	0.114110	0.804412	410
80.5396	798.739	362	3.48344	1.06440	0.110113	0.785974	411
79.9431	800.844	359	3.21163	1.33099	0.102671	0.728354	412
79.9299	801.128	360	3.78825	0.790199	0.121090	0.859273	413
79.7565	799.611	342	3.30795	1.17530	0.106947	0.753351	414
80.1994	799.238	365	3.72987	0.818989	0.119077	0.845224	415
80.2010	798.892	337	3.38017	1.09509	0.108178	0.766474	416
80.3099	799.350	326	3.25036	1.18465	0.103972	0.737180	417
80.0975	798.623	371	3.03988	1.30810	9.718536E-02	0.688921	418
80.1478	800.149	344	3.81974	0.777269	0.121979	0.865922	419
79.9568	800.363	350	3.57160	0.970079	0.114411	0.810595	420
80.2639	799.368	363	4.27152	0.706908	0.135868	0.966347	421

79.9438	798.367	355	3.46732	1.03860	0.111493	0.787473	422
79.7599	801.625	368	3.31581	1.11918	0.106448	0.753671	423
79.7918	800.503	341	3.14263	1.23065	0.101304	0.715120	424
80.3443	798.590	338	3.61985	0.966165	0.115667	0.820456	425
80.2619	798.271	369	3.35161	1.09930	0.106889	0.758785	426
79.7686	800.034	337	3.41033	1.07215	0.110051	0.776168	427
80.1568	800.044	376	3.37649	1.01846	0.107470	0.764332	428
79.9316	798.991	363	3.38748	1.41073	0.108935	0.769550	429
80.1628	798.698	367	2.83500	1.63023	9.064493E-02	0.642659	430
80.1333	799.836	356	3.74755	0.792422	0.119822	0.849995	431
79.9417	799.597	365	3.26262	1.04664	0.104290	0.739407	432
80.1049	798.261	386	3.12604	1.26852	0.100013	0.708555	433
79.9372	801.283	364	3.24324	1.17464	0.103830	0.736284	434
80.0087	799.285	347	3.41733	0.993858	0.109584	0.775591	435
80.0794	801.759	353	3.72956	0.887052	0.118764	0.844999	436
80.1370	799.490	355	3.31041	1.32163	0.105993	0.751109	437
79.9786	798.488	363	3.44344	0.921331	0.110520	0.781536	438
80.3070	799.396	341	3.11518	1.19250	9.949275E-02	0.706210	439
80.4166	799.720	366	3.37428	0.903249	0.106952	0.762658	440
80.3642	798.972	355	3.31816	1.04664	0.105584	0.750854	441
80.6104	798.682	366	2.87988	1.57737	9.108727E-02	0.650071	442
80.0475	799.604	338	4.04941	0.710115	0.130209	0.920525	443
80.0787	797.936	362	3.49576	1.14079	0.112023	0.792613	444
80.2197	799.385	343	3.60051	0.928115	0.115010	0.816058	445
80.2742	800.428	334	3.51734	0.993929	0.112211	0.797246	446
80.3095	799.680	359	3.66830	1.04540	0.117017	0.831322	447
80.2598	798.779	365	3.71650	0.950808	0.118317	0.840812	448
80.1663	800.174	350	3.15417	1.37969	0.100713	0.715069	449
80.0949	800.511	360	3.76457	0.854500	0.119985	0.852733	450
80.0391	799.556	347	3.48974	0.930870	0.111604	0.791180	451
80.2020	800.361	357	3.25424	1.18285	0.103749	0.737391	452
80.2265	798.675	363	3.36853	1.07805	0.107395	0.762533	453
80.1168	799.816	355	3.92000	0.852508	0.125533	0.889725	454
80.1752	798.755	356	3.45384	1.18520	0.110550	0.783314	455
80.0894	799.475	329	3.72291	0.882641	0.119484	0.845329	456
79.8820	799.060	359	3.62875	0.961070	0.116745	0.824591	457
80.4258	797.688	350	4.00363	0.658416	0.127710	0.906521	458
79.7643	799.836	360	3.44250	1.09795	0.110906	0.782872	459
80.2274	800.605	345	3.64429	0.861189	0.116224	0.826036	460
80.2218	798.890	349	3.29098	1.07165	0.105083	0.745570	461
80.1506	801.080	355	3.92511	0.794457	0.125065	0.889379	462
80.2442	798.734	333	3.46137	1.03034	0.110529	0.784061	463
79.9145	799.551	347	3.76353	0.980482	0.121021	0.855199	464
79.7833	799.700	384	3.21120	1.10756	0.103083	0.729079	465
80.5150	797.822	360	3.44052	1.12943	0.109192	0.777297	466
80.1544	798.672	346	3.49813	1.00546	0.112207	0.794066	467
80.4353	798.887	373	3.28609	1.12075	0.104269	0.742737	468
80.0733	799.384	326	4.19232	0.711944	0.135078	0.953639	469
80.1913	798.968	358	3.35547	1.13603	0.107334	0.760934	470
80.4225	798.920	347	3.62419	0.918444	0.115162	0.819588	471
80.3280	800.023	379	3.56080	0.926293	0.112827	0.804656	472
80.2521	800.162	358	3.10413	1.49269	9.907317E-02	0.703702	473
80.2395	798.254	358	3.49201	0.937323	0.111437	0.790743	474
80.1320	799.380	373	3.60805	0.862370	0.115214	0.817692	475
80.3097	799.368	360	3.44009	0.975096	0.109608	0.779125	476
79.9662	799.226	334	3.36239	0.975945	0.108025	0.763576	477
80.2876	799.379	372	3.77065	0.738359	0.119801	0.852804	478
79.9387	799.437	362	3.59465	0.998902	0.115129	0.815303	479
79.9607	800.034	346	3.16691	1.26920	0.101606	0.719166	480
79.9534	799.380	348	3.20421	1.25587	0.102840	0.727452	481
80.1369	799.387	365	3.18642	1.12479	0.101756	0.722081	482
79.7986	799.496	364	3.51949	1.00087	0.112917	0.798617	483
80.3861	800.058	372	3.19850	1.09343	0.101333	0.722845	484

79.9538	800.207	344	3.41920	1.00752	0.109798	0.776828	485
80.0739	800.451	357	3.49500	0.969695	0.111780	0.792944	486
80.1834	799.080	362	3.29801	1.19926	0.105271	0.747094	487
79.8930	800.839	367	3.61036	0.909641	0.115774	0.820073	488
79.9539	799.360	324	3.65433	0.873303	0.117958	0.831719	489
80.3099	798.772	345	3.22458	1.28901	0.103278	0.731772	490
80.0279	800.369	352	3.40182	1.01328	0.108759	0.771488	491
79.9597	800.007	368	3.31986	0.999178	0.106272	0.753213	492
80.4202	800.609	347	3.64435	0.966917	0.115570	0.824128	493
79.7703	799.319	353	3.68525	0.875724	0.118799	0.838079	494
80.1131	799.646	336	3.93584	0.775510	0.126203	0.893592	495
80.1325	799.329	389	3.81902	0.823684	0.121641	0.864366	496
80.2173	798.715	352	3.95270	0.699699	0.126226	0.895518	497
80.1139	800.192	364	3.37037	1.09054	0.107114	0.762236	498
80.3260	798.228	346	3.72317	0.906938	0.118910	0.843486	499
80.2667	798.544	377	3.74921	0.807779	0.119303	0.848071	500

average tau = 80.1192 sigma tau = 0.197362 average red chisq = 1.01401

average amp = 799.481 sigma amp = 0.814629

These next results just subtract a constant and not a line to fit

80.5752	798.719	362	3.35893	1.25422	0.106458	0.758921	1
81.3499	800.178	388	3.12312	1.46224	9.619500E-02	0.697805	2
80.9149	800.150	374	3.44697	1.06936	0.107544	0.774203	3
79.7548	799.576	338	3.80135	0.872096	0.122846	0.865519	4
79.0135	798.541	331	3.63604	0.910300	0.119872	0.833683	5
80.9586	799.648	368	3.61061	0.864946	0.112814	0.811429	6
80.1569	797.891	362	3.42433	1.17022	0.109603	0.776111	7
79.4741	797.292	333	3.37546	1.13809	0.110575	0.771965	8
80.4532	800.183	354	3.22931	1.27131	0.102319	0.729907	9
81.1125	799.681	387	3.49142	1.11565	0.108355	0.782321	10
80.5077	799.022	368	3.49128	1.06853	0.110484	0.788274	11
79.6002	797.450	334	3.31525	1.18316	0.108166	0.757040	12
79.1626	798.503	341	3.29905	1.29514	0.108376	0.755483	13
81.2251	800.317	368	3.19251	1.31821	9.898882E-02	0.715506	14
79.3292	798.780	335	3.69603	0.829978	0.120672	0.844350	15
79.5734	800.261	346	2.89662	1.43467	9.361563E-02	0.659527	16
79.0577	799.572	327	3.84548	0.823077	0.126538	0.881585	17
80.4351	798.613	369	3.39535	1.15101	0.107503	0.766452	18
80.2080	799.272	353	3.19878	1.18468	0.102157	0.724964	19
81.0140	801.243	377	3.52520	0.959513	0.109852	0.792122	20
79.6472	797.392	341	3.58371	1.08685	0.116763	0.817924	21
79.1770	797.883	352	3.95079	0.834789	0.129852	0.904799	22
81.1471	800.222	361	3.30753	1.27443	0.102671	0.741399	23
81.2293	801.075	392	3.29666	1.30104	0.101711	0.737371	24
79.0025	798.244	349	3.67338	0.967762	0.121068	0.842169	25
80.0539	796.887	347	3.58448	1.00537	0.115628	0.814850	26
78.9916	797.869	355	3.19001	1.45865	0.105399	0.732083	27
79.6977	799.893	352	3.09632	1.41760	9.995625E-02	0.704716	28
79.8389	799.929	337	3.42816	1.09868	0.110690	0.780525	29
81.2043	801.602	401	3.84772	1.06123	0.118336	0.859339	30
80.5819	799.177	361	3.72136	0.963760	0.117562	0.839674	31
79.7624	797.706	353	3.61928	0.871084	0.117244	0.824314	32
79.4496	799.280	357	3.26257	1.15898	0.106372	0.745506	33
79.2025	798.523	321	3.19185	1.34033	0.104995	0.731267	34
81.2617	799.766	367	3.68642	1.08504	0.114376	0.826180	35
81.4258	800.050	376	3.38624	1.27795	0.104369	0.756912	36
79.0984	799.037	343	3.58073	1.04718	0.117433	0.819482	37
79.2053	797.303	336	3.28119	1.22488	0.107982	0.751594	38
79.0145	798.898	342	3.79666	0.924034	0.125149	0.870818	39
80.3093	799.649	348	3.79084	0.766531	0.120884	0.858941	40
81.0018	800.847	360	3.27709	1.18600	0.102249	0.736527	41
81.9007	797.679	399	3.06411	1.55532	9.361162E-02	0.681858	42

79.0546	798.397	356	3.20801	1.16024	0.105445	0.734727	43
80.8937	801.212	369	3.71971	0.912976	0.116093	0.836110	44
80.4620	798.455	375	3.53119	0.961825	0.111773	0.797009	45
80.7560	799.296	398	3.50466	1.01101	0.109674	0.787633	46
79.9229	798.424	357	3.83225	0.797567	0.123288	0.870592	47
79.1885	798.613	342	3.65571	0.991163	0.120112	0.837378	48
81.5235	799.089	409	3.34716	1.34546	0.102667	0.746144	49
81.1204	799.863	381	3.42974	1.15679	0.106547	0.768974	50
79.2017	800.237	321	3.75823	0.958521	0.123496	0.861541	51
79.3583	799.124	339	3.96943	0.834829	0.129738	0.907565	52
79.5923	798.689	360	3.41586	0.906116	0.110751	0.778434	53
78.9600	798.512	352	3.17475	1.36717	0.104751	0.728286	54
81.5847	798.961	371	3.35670	1.22900	0.103536	0.750466	55
79.6337	799.621	361	3.19935	1.14029	0.103511	0.728806	56
79.7898	798.578	347	3.55888	0.959565	0.114734	0.808950	57
80.1546	798.452	351	3.69306	0.891105	0.118347	0.837846	58
79.1100	799.001	357	3.46815	1.07273	0.113534	0.793024	59
79.0785	799.572	329	3.75483	0.976314	0.123814	0.861704	60
81.5437	798.443	390	3.63253	1.09450	0.112137	0.812073	61
79.1833	797.368	337	3.47778	1.04189	0.114437	0.796540	62
80.1981	799.210	335	3.61992	1.08164	0.115630	0.820157	63
79.6544	798.746	343	3.33825	1.07673	0.108248	0.760831	64
79.7661	799.878	346	3.38526	1.14940	0.109125	0.770012	65
81.2681	799.715	390	3.46942	1.21362	0.107396	0.776717	66
81.1743	799.395	377	3.22713	1.20710	0.100440	0.724155	67
80.5295	800.762	365	3.23877	1.14087	0.102256	0.731268	68
81.1212	800.193	333	3.68458	1.06262	0.115302	0.828947	69
81.5132	799.000	391	3.80558	0.972829	0.117146	0.849749	70
80.3488	800.058	346	3.36063	1.29186	0.106620	0.759681	71
81.0890	799.395	365	3.49887	1.08313	0.108959	0.785066	72
81.0548	801.092	383	3.82786	0.897622	0.118880	0.858688	73
81.2394	800.693	384	3.09947	1.58032	9.577431E-02	0.693656	74
81.5514	799.733	369	3.34646	1.28411	0.103012	0.747691	75
80.4852	800.056	361	3.78132	0.826019	0.119632	0.854166	76
78.9729	798.135	331	3.24508	1.37326	0.107594	0.745907	77
81.0999	800.853	369	3.52846	1.05434	0.109650	0.791696	78
81.3681	800.252	389	3.64958	1.21646	0.112557	0.815981	79
80.6125	801.024	361	3.35312	1.16301	0.105525	0.756102	80
79.1657	797.799	349	3.76358	1.12637	0.124127	0.863248	81
79.4488	799.147	363	3.81497	0.864751	0.123863	0.869859	82
79.4700	798.801	325	3.67780	0.982180	0.119797	0.839332	83
79.9788	798.264	363	3.47768	1.05765	0.111454	0.788575	84
81.3637	800.117	389	3.52363	1.13872	0.108449	0.787045	85
81.1215	799.783	381	3.34679	1.21538	0.104064	0.750708	86
81.0162	800.313	365	3.54006	1.00702	0.110448	0.795369	87
80.9134	798.979	390	3.83728	0.874359	0.120019	0.862337	88
79.2027	797.481	325	3.43734	1.24997	0.113341	0.788006	89
78.9136	799.854	337	3.32349	1.10042	0.109633	0.762748	90
81.1266	799.913	340	4.15649	0.765749	0.129719	0.933839	91
80.3775	799.853	356	4.03708	0.788560	0.128219	0.913133	92
81.1796	798.720	395	3.23241	1.23188	0.100304	0.723974	93
79.3644	797.978	342	3.71821	0.973881	0.121723	0.850237	94
80.4357	801.022	353	3.52745	1.01543	0.111586	0.797037	95
79.4189	800.254	333	3.73932	0.858612	0.121858	0.854445	96
79.8582	800.608	331	3.68828	0.784716	0.118937	0.839599	97
81.2168	799.792	392	3.68831	1.04885	0.114188	0.825706	98
78.8455	800.299	343	3.28894	1.29333	0.108408	0.754598	99
79.1172	799.132	347	3.37043	1.23929	0.110905	0.772746	100
79.2876	798.331	332	3.72907	0.926273	0.122114	0.852723	101
79.2060	799.295	350	3.54942	0.939381	0.116217	0.812116	102
80.2908	798.184	357	3.53354	0.829835	0.112664	0.799896	103
79.6712	797.591	348	3.00889	1.38083	9.762851E-02	0.685486	104
79.4174	798.267	343	3.61439	1.14088	0.118292	0.826633	105

81.4753	799.725	387	3.27493	1.31766	0.100870	0.731877	106
79.7868	799.882	340	3.69000	0.839983	0.118999	0.839553	107
80.2273	800.395	367	3.86147	0.829745	0.122729	0.873803	108
81.6540	800.734	399	3.43332	1.23383	0.105195	0.766095	109
80.7829	800.708	354	3.66185	0.988841	0.114869	0.824484	110
79.5687	797.146	364	3.16847	1.56390	0.103286	0.723181	111
79.0097	798.493	346	3.78150	1.02349	0.124660	0.867116	112
79.1693	797.661	337	3.46777	1.13409	0.114238	0.794792	113
79.2229	797.702	339	3.27151	1.15716	0.107654	0.749602	114
80.9846	798.497	392	3.45707	1.13683	0.107789	0.775585	115
79.5950	799.322	316	3.65760	1.05415	0.119371	0.835964	116
79.3177	797.764	331	3.82750	0.852904	0.125306	0.874870	117
79.8080	798.114	372	3.44549	1.11420	0.111397	0.784258	118
81.1331	799.512	371	3.40415	1.12794	0.105697	0.762852	119
81.3006	799.152	376	3.26824	1.09556	0.101367	0.732345	120
80.9032	801.380	364	3.52226	1.06752	0.109951	0.791825	121
81.0167	799.819	390	3.64052	1.04749	0.113303	0.816705	122
79.2561	797.301	353	3.16746	1.11900	0.103921	0.724688	123
79.3927	799.064	324	3.45998	1.13226	0.112990	0.790566	124
80.1043	798.235	361	3.54622	0.960543	0.113690	0.804528	125
80.8330	799.072	384	3.17039	1.33446	9.928060E-02	0.712785	126
81.4018	799.284	368	3.84861	0.981037	0.119119	0.861631	127
80.7192	801.042	396	3.76373	0.906942	0.117878	0.846987	128
79.1808	797.798	344	3.61394	0.932460	0.118924	0.828115	129
79.2990	799.110	360	3.66545	1.05818	0.119684	0.837659	130
78.9772	798.225	343	3.62746	1.17466	0.119761	0.832132	131
81.3821	800.521	389	3.72378	0.985731	0.114981	0.833312	132
79.4397	799.042	351	3.42749	1.19310	0.112000	0.783862	133
81.2268	799.725	388	3.51247	1.11616	0.108829	0.786695	134
80.3877	800.010	358	3.22707	1.26418	0.102413	0.729741	135
79.0602	798.519	340	3.21446	1.45398	0.105806	0.736592	136
81.5022	801.027	352	3.74362	1.10526	0.115542	0.837937	137
80.9989	801.615	376	3.96549	0.804499	0.122892	0.888647	138
79.2489	799.357	339	3.40435	0.970784	0.111052	0.777484	139
81.3267	800.447	380	3.14578	1.39889	9.716319E-02	0.703968	140
79.3332	799.070	350	2.95921	1.71820	9.661254E-02	0.676182	141
81.1998	800.382	392	3.44465	1.12577	0.106491	0.770863	142
81.5734	799.880	408	3.27585	1.39082	0.100453	0.730645	143
79.0466	797.073	312	3.93678	0.888286	0.130553	0.904211	144
79.3237	798.835	357	2.80247	1.50789	9.131192E-02	0.639719	145
79.6828	799.512	357	3.99778	0.839194	0.128911	0.909159	146
79.3697	798.673	329	3.39464	1.18255	0.111082	0.776283	147
80.7268	799.557	375	3.38166	1.01917	0.106333	0.761834	148
79.0080	798.859	348	3.48360	0.958281	0.114703	0.798601	149
79.9200	799.351	370	3.63569	0.899664	0.116675	0.825434	150
81.1453	801.355	354	3.39581	1.34007	0.105381	0.761491	151
81.0288	799.744	373	3.68712	1.07431	0.114778	0.827190	152
79.3515	797.259	323	3.71752	0.890490	0.122192	0.851180	153
79.7848	798.622	345	3.99971	0.677414	0.129293	0.910482	154
79.2675	796.525	340	3.20277	1.16107	0.105381	0.733386	155
79.3009	797.527	309	3.81733	0.867420	0.125945	0.875434	156
79.4475	799.289	331	3.09864	1.45287	0.101333	0.708861	157
79.0936	799.136	338	3.35884	1.03773	0.110288	0.769135	158
79.8382	798.486	326	3.53814	0.917492	0.114885	0.806995	159
79.3957	796.933	324	3.43565	1.06296	0.112913	0.786571	160
79.6606	797.275	348	3.42131	1.08335	0.111113	0.779655	161
80.6953	799.103	366	3.57020	0.819141	0.112372	0.804427	162
80.7676	800.836	379	3.63586	1.06704	0.113721	0.817606	163
79.4068	798.611	353	3.44720	1.32472	0.112465	0.787375	164
80.8376	799.821	374	3.46008	1.09049	0.108358	0.778306	165
81.1368	799.679	374	3.60663	1.03091	0.112120	0.808837	166
81.3405	798.654	397	3.34865	1.31430	0.103682	0.749412	167
79.6436	798.303	349	3.39720	0.983409	0.110221	0.774285	168

80.0432	798.883	341	3.08332	1.29177	9.885554E-02	0.699563	169
81.1768	798.854	373	3.67063	0.978194	0.113970	0.822352	170
79.5810	800.383	335	3.53122	1.02835	0.114837	0.806529	171
81.7218	800.497	398	3.38373	1.32046	0.103465	0.754250	172
79.0735	798.865	338	3.90281	0.872281	0.128488	0.894667	173
79.1881	797.276	365	3.31799	1.21128	0.108894	0.759101	174
81.7305	799.764	381	3.52040	1.22451	0.107885	0.785291	175
79.4082	799.778	318	3.32481	1.31811	0.108833	0.760884	176
79.2017	798.242	339	3.49530	0.906997	0.114680	0.799934	177
80.0732	800.081	350	3.62814	0.846530	0.116134	0.823313	178
80.1462	797.627	341	3.62051	0.923870	0.116220	0.821526	179
79.0223	799.155	347	3.28825	1.16604	0.108302	0.754047	180
79.4165	798.875	346	3.37240	1.17283	0.110039	0.770439	181
81.0940	799.372	374	3.67824	1.07377	0.114393	0.824725	182
79.1531	799.460	337	3.75412	0.852220	0.122964	0.858924	183
80.3239	799.383	367	3.92178	0.867436	0.124564	0.886801	184
79.1700	798.856	321	3.32085	1.22942	0.109420	0.761604	185
79.3937	799.884	362	3.64773	0.968134	0.118683	0.832808	186
81.1617	800.567	366	3.86716	0.833787	0.119982	0.866930	187
79.1197	799.139	308	3.76040	0.963719	0.124074	0.862753	188
80.2920	799.598	355	3.33787	1.12200	0.106324	0.755802	189
81.4332	800.135	386	2.94516	1.72703	9.078069E-02	0.658426	190
80.5361	801.382	365	3.23455	1.19909	0.101897	0.729764	191
79.1367	798.990	333	3.54212	1.21224	0.116679	0.812282	192
79.1971	797.648	340	3.44039	1.18484	0.113114	0.787846	193
80.4562	799.461	375	3.51633	1.05869	0.110912	0.792717	194
79.3895	798.443	330	3.26055	1.25651	0.106759	0.745791	195
79.1134	798.992	331	3.77864	0.878767	0.124292	0.865927	196
80.6610	800.644	373	3.24650	1.16195	0.102016	0.731495	197
79.3271	799.856	359	3.92799	0.853287	0.128433	0.898809	198
80.0010	798.471	361	3.57551	0.955109	0.114915	0.812074	199
81.3916	799.847	425	3.00954	1.51861	9.264000E-02	0.672146	200
80.6218	799.352	352	3.41553	1.14707	0.108183	0.771792	201
79.4900	797.896	345	3.56528	1.04475	0.116352	0.814299	202
79.1324	798.460	349	3.13369	1.39314	0.103117	0.718185	203
81.0383	800.899	374	3.50117	1.17346	0.109071	0.786374	204
79.6613	798.837	366	3.32808	1.12338	0.107775	0.758230	205
79.5567	799.220	335	3.03838	1.33231	9.907503E-02	0.694365	206
80.3065	799.114	357	3.67880	0.818830	0.117223	0.833043	207
79.8580	797.978	310	3.58764	0.994946	0.116497	0.817736	208
79.0228	799.310	350	3.56252	1.06585	0.117163	0.816416	209
79.3520	798.019	344	3.64415	0.983684	0.119272	0.833199	210
79.0204	799.833	340	3.36028	1.13253	0.110416	0.769922	211
79.3998	798.870	343	3.70814	1.00472	0.121270	0.848119	212
81.3707	800.194	350	3.54721	1.05523	0.110066	0.795407	213
79.9463	800.306	353	3.35788	1.09550	0.107626	0.762243	214
80.3888	800.497	362	3.61401	0.939571	0.114282	0.816102	215
81.2543	800.968	383	3.64812	1.06062	0.112691	0.816541	216
80.7095	800.444	361	3.58960	1.02517	0.112913	0.809164	217
81.4323	798.564	385	3.16164	1.54345	9.777223E-02	0.707232	218
79.3656	799.229	324	3.60317	0.861622	0.118100	0.824951	219
80.1654	799.712	363	3.65536	1.03165	0.116251	0.826818	220
79.2242	797.905	343	3.20933	1.22385	0.105071	0.733562	221
81.2702	800.311	385	3.40533	1.18053	0.105259	0.762088	222
79.2284	797.870	344	3.29985	1.34916	0.108524	0.755954	223
79.4406	798.935	344	3.42769	1.05740	0.111769	0.782958	224
80.3229	797.932	333	3.76244	0.886937	0.120252	0.852359	225
79.6205	798.579	352	3.22518	1.32252	0.104597	0.734961	226
79.4326	798.074	318	3.51641	1.05404	0.115266	0.804540	227
81.6804	800.340	391	3.51349	1.31876	0.107525	0.783161	228
79.4671	798.963	347	3.66723	0.996012	0.119504	0.837505	229
81.4534	798.594	371	3.52793	1.21514	0.109198	0.789611	230
79.7165	798.523	328	3.28403	1.15190	0.106620	0.748738	231

78.7985	798.746	336	3.66270	0.965585	0.121643	0.842572	232
81.4772	800.775	372	3.64377	1.35335	0.112013	0.813756	233
79.0832	798.901	349	3.47816	1.14040	0.114335	0.796860	234
79.8900	799.863	368	3.15022	1.18135	0.100984	0.714955	235
81.2905	799.162	382	3.53348	1.15566	0.109378	0.790870	236
80.7618	799.342	377	3.54127	1.06677	0.110844	0.795932	237
80.1118	799.524	345	3.36735	1.19181	0.107921	0.764258	238
80.9408	799.325	359	3.14681	1.22495	9.863440E-02	0.708096	239
79.1356	798.789	328	3.50736	0.960634	0.115507	0.804212	240
80.7579	799.585	398	3.70813	0.839229	0.116246	0.834337	241
79.1603	798.997	332	3.59649	1.03047	0.118190	0.823978	242
81.0895	800.603	381	3.09963	1.16117	9.643724E-02	0.695844	243
79.8203	798.605	368	3.21453	1.15040	0.103503	0.730460	244
81.3525	799.177	349	3.54391	1.07371	0.110065	0.794495	245
81.3642	800.198	384	3.86206	0.992819	0.119147	0.863629	246
79.2889	797.130	341	3.52528	1.27606	0.116220	0.808289	247
79.3975	798.263	358	3.75353	0.866843	0.122601	0.857782	248
81.2892	799.203	375	3.76415	0.961508	0.116843	0.843699	249
79.0588	798.736	341	3.11013	1.29991	0.102308	0.712606	250
79.3782	798.732	368	3.68909	0.846432	0.120183	0.842260	251
81.6681	799.103	393	3.08433	1.62805	9.466608E-02	0.688035	252
79.5458	799.551	335	3.39636	1.12455	0.110255	0.774506	253
80.3981	799.447	338	3.33587	1.05232	0.105958	0.754327	254
81.1805	800.984	376	3.74094	1.02938	0.115824	0.837961	255
79.5490	798.783	344	3.08802	1.59631	0.100574	0.705032	256
81.1094	799.474	364	3.58845	1.15558	0.111794	0.805445	257
81.6114	798.573	405	3.88633	0.983959	0.119366	0.866906	258
79.3365	799.391	342	3.50932	1.03028	0.114526	0.801943	259
81.2206	800.994	367	3.98336	0.897204	0.123405	0.892691	260
80.0120	799.815	358	3.32170	1.01118	0.106269	0.753348	261
79.4219	800.379	357	3.27240	1.16729	0.106418	0.747214	262
81.1911	800.727	400	3.79005	0.935294	0.117159	0.848344	263
81.1918	800.517	369	3.54677	1.08541	0.109944	0.794778	264
80.1036	800.869	355	2.90669	1.29654	9.279899E-02	0.659147	265
79.1926	798.593	361	3.40229	1.09514	0.111152	0.777232	266
79.7686	799.417	359	3.57770	1.01880	0.115310	0.813585	267
80.8700	798.875	374	3.60188	1.00894	0.112724	0.809515	268
78.9957	799.077	307	3.53196	1.10005	0.116745	0.810726	269
79.4258	799.589	349	3.68826	1.00619	0.119919	0.841554	270
79.6299	798.626	326	3.84980	0.836860	0.125112	0.877939	271
81.0572	799.024	371	3.14134	1.38384	9.777285E-02	0.704463	272
79.6138	800.462	355	3.60048	0.896583	0.116338	0.819981	273
79.4337	799.031	353	3.63247	0.954256	0.118457	0.829898	274
80.8742	800.030	364	3.72974	0.968282	0.117021	0.839881	275
80.2866	800.036	343	3.54896	1.01610	0.112770	0.802675	276
79.1307	798.259	336	3.58754	0.951674	0.117750	0.820983	277
80.9352	800.472	383	3.46939	0.931145	0.108278	0.779683	278
80.3775	799.955	334	3.60773	0.927312	0.114631	0.816078	279
81.6058	799.826	392	3.43272	1.26998	0.105232	0.765515	280
79.9458	798.230	348	3.48708	1.00536	0.112219	0.792185	281
80.8849	800.371	397	3.35313	1.09446	0.104647	0.753358	282
80.3698	798.090	382	3.33481	1.03164	0.105978	0.753836	283
80.1669	799.653	370	3.18767	1.52366	0.101918	0.722869	284
79.8164	800.286	345	3.95829	0.753893	0.127377	0.899978	285
79.3575	797.815	336	3.15166	1.38365	0.103392	0.721350	286
81.5232	798.847	389	3.90858	0.989315	0.120348	0.872865	287
78.8892	798.636	323	3.17594	1.50941	0.105240	0.729664	288
80.6531	799.520	356	3.79023	0.755483	0.119729	0.855594	289
81.2618	798.082	366	3.91593	0.945654	0.121826	0.877952	290
79.2082	798.270	338	2.99041	1.41987	9.802345E-02	0.684059	291
80.2802	798.519	373	3.38840	0.965823	0.107951	0.766929	292
81.9410	798.845	410	3.55777	1.32509	0.108155	0.790371	293
81.3760	799.214	386	3.80931	0.941303	0.117550	0.851463	294

81.1416	798.981	365	3.48223	1.11437	0.108446	0.781204	295
80.6564	799.911	370	3.56650	0.930031	0.112309	0.804071	296
80.1217	799.373	360	3.81851	0.818804	0.122319	0.866625	297
79.2198	798.076	331	3.58508	1.13050	0.117739	0.820613	298
79.2859	798.717	328	3.49327	1.17714	0.114457	0.799170	299
79.4332	799.234	343	3.63324	0.973754	0.118320	0.829469	300
79.1828	799.869	334	3.62983	0.918150	0.119089	0.831426	301
79.2521	799.652	339	3.25018	1.20372	0.106272	0.743282	302
80.8590	798.665	399	3.49622	0.933254	0.109454	0.785872	303
79.2769	799.268	344	3.97771	0.886398	0.130150	0.909873	304
79.3190	798.229	335	3.68277	1.01113	0.120946	0.843453	305
79.5738	798.907	347	3.30029	1.21905	0.107232	0.752828	306
80.9391	798.993	368	3.57931	1.08382	0.111704	0.803484	307
80.6497	799.891	342	3.25589	1.17833	0.102678	0.734354	308
80.7208	800.234	350	3.65477	1.02328	0.114962	0.823641	309
79.7244	799.113	343	3.57532	0.934402	0.115723	0.814448	310
79.5936	797.275	347	3.74463	0.898545	0.121959	0.854349	311
81.2615	799.969	396	3.74746	0.943977	0.115919	0.838876	312
81.4461	800.643	411	3.45148	1.23455	0.105845	0.769954	313
80.2095	800.748	353	3.22170	1.25959	0.102501	0.729383	314
79.3407	800.014	344	3.51909	1.14150	0.115195	0.805705	315
79.7630	799.643	358	3.47248	0.990860	0.111822	0.789435	316
79.3832	797.844	337	3.67260	0.888176	0.120323	0.840132	317
81.1369	799.920	376	3.53598	1.14966	0.109958	0.793215	318
80.0353	798.912	331	3.62184	0.946338	0.116501	0.822916	319
79.2275	798.301	337	3.86222	0.884105	0.126639	0.883629	320
81.3011	801.060	380	3.79704	1.08519	0.116974	0.848700	321
79.2723	798.062	321	3.25228	1.40570	0.107207	0.745867	322
80.4408	798.629	383	3.50115	0.984028	0.111038	0.791042	323
79.3783	797.709	319	3.59510	1.13450	0.117982	0.822643	324
79.1220	798.732	339	3.93759	0.831132	0.129442	0.902047	325
80.8380	799.814	349	3.85393	0.835014	0.120829	0.867224	326
81.0004	800.523	390	3.15160	1.29418	9.811786E-02	0.707494	327
79.4323	798.286	352	3.79743	0.894593	0.123708	0.866693	328
81.2318	800.637	341	3.60708	1.09351	0.112295	0.809945	329
79.2657	799.880	342	3.51496	1.18284	0.115262	0.805121	330
79.2960	799.027	326	3.35429	1.09834	0.109885	0.767482	331
79.5123	797.840	353	3.12267	1.38468	0.101592	0.712154	332
81.2865	800.743	392	3.41845	1.20338	0.105526	0.764807	333
80.1590	799.981	354	3.59710	0.930003	0.114806	0.815224	334
78.9951	799.337	321	4.00837	0.834161	0.132089	0.919094	335
79.0215	799.404	350	3.74080	1.00796	0.122958	0.857059	336
81.5573	801.298	384	4.17066	0.932124	0.127708	0.930177	337
81.5380	799.584	384	3.44212	1.23070	0.106030	0.769282	338
79.4893	797.929	351	3.33582	1.10438	0.108937	0.762261	339
79.7127	799.025	360	3.45592	1.05816	0.111477	0.785942	340
79.5111	797.649	364	3.15568	1.37718	0.102513	0.719108	341
81.0694	799.390	367	3.37573	1.13727	0.105246	0.757887	342
81.0339	800.806	393	3.45145	1.21378	0.107176	0.773937	343
79.1269	798.758	320	3.30345	1.25473	0.109015	0.757984	344
79.6456	801.542	373	3.45659	1.07726	0.111019	0.785523	345
80.5815	800.527	377	3.65061	1.02365	0.114725	0.822272	346
81.0898	799.665	389	3.45800	1.21049	0.107570	0.775650	347
78.9901	798.264	341	3.61089	1.00903	0.119231	0.828498	348
80.8235	799.390	370	3.14170	1.25768	9.858922E-02	0.707162	349
81.1486	799.793	401	3.57061	1.08926	0.110725	0.799868	350
80.9147	799.207	349	3.80152	0.941734	0.119362	0.855854	351
79.2976	797.490	324	3.63752	0.813996	0.119629	0.833130	352
79.0439	800.276	346	3.08674	1.66889	0.101616	0.708211	353
78.7478	798.535	350	3.71878	1.00941	0.123271	0.854502	354
78.6675	799.372	330	3.84293	1.05931	0.127797	0.884418	355
80.9857	798.739	355	3.45623	1.20098	0.108226	0.776979	356
81.0917	797.428	376	3.65590	1.11378	0.114158	0.820304	357

79.2743	798.258	352	2.63526	1.76513	8.617473E-02	0.602319	358
80.6310	801.281	387	3.76107	0.829407	0.117648	0.845882	359
80.6472	800.255	340	3.98255	0.686000	0.125874	0.899482	360
78.7075	799.334	342	3.58906	1.03969	0.118815	0.824425	361
81.4506	801.132	373	3.77913	1.01400	0.116345	0.844973	362
79.9660	799.636	367	3.24232	1.11116	0.103848	0.735653	363
79.0202	798.369	348	3.77243	0.963892	0.124232	0.864593	364
80.0216	799.107	333	3.62867	0.864698	0.116503	0.823799	365
78.9334	798.879	340	3.44349	1.25273	0.113815	0.790559	366
81.0987	800.603	379	3.44612	1.27229	0.106777	0.771829	367
81.2033	800.545	355	3.46621	1.18232	0.107494	0.776883	368
79.7221	799.352	335	3.81400	0.895538	0.123545	0.869149	369
80.6555	799.148	380	3.39053	1.10218	0.106366	0.762575	370
78.7669	798.151	331	3.41421	1.24930	0.113542	0.785454	371
81.1517	800.500	377	3.59729	1.04808	0.111679	0.806679	372
79.9921	799.711	361	3.55021	1.03149	0.113760	0.805680	373
81.3150	798.952	393	3.29678	1.22453	0.102164	0.738287	374
81.2033	799.895	389	3.81368	0.943056	0.117935	0.853348	375
79.4317	798.340	344	3.25200	1.29882	0.106284	0.743362	376
81.0871	800.190	386	3.07291	1.33719	9.569345E-02	0.689920	377
80.7041	799.853	351	3.35052	1.02702	0.105500	0.755355	378
79.8993	800.043	372	3.18535	1.23769	0.102069	0.722924	379
79.6741	797.823	343	3.57633	0.985839	0.116005	0.814762	380
79.2309	799.619	334	3.03671	1.63858	9.955765E-02	0.695234	381
81.0933	798.674	376	3.04431	1.22508	9.478719E-02	0.682843	382
81.0421	801.849	393	3.45035	1.01765	0.107089	0.774065	383
78.8266	798.614	332	3.36154	1.32909	0.111297	0.771976	384
79.1262	798.878	345	3.45557	1.23412	0.113762	0.792341	385
81.0720	801.836	347	3.27256	1.24546	0.102012	0.735621	386
81.0908	798.699	381	3.48026	1.10446	0.108605	0.781507	387
78.9021	797.811	327	2.95920	1.81740	9.826081E-02	0.680292	388
80.6582	799.541	364	3.58026	0.961846	0.112983	0.807879	389
80.4361	800.499	368	2.97027	1.55350	9.372170E-02	0.670039	390
80.1814	799.954	355	3.73533	0.922870	0.119280	0.846737	391
80.5708	799.112	375	3.99582	0.695227	0.125970	0.900732	392
80.5809	800.441	367	3.20708	1.17085	0.100767	0.722272	393
79.3793	799.676	361	3.28693	1.26633	0.106941	0.750233	394
79.0583	798.121	345	3.20027	1.43985	0.105276	0.732970	395
81.2613	799.415	381	3.29455	1.18138	0.102215	0.738297	396
79.4678	798.251	349	3.65003	0.999270	0.119021	0.833531	397
80.0297	799.310	366	3.79158	0.926263	0.121387	0.859919	398
79.3972	798.915	333	3.74491	0.896974	0.122166	0.855350	399
80.2300	799.621	337	3.55744	0.984495	0.113458	0.805722	400
79.1405	797.996	326	3.80963	0.899794	0.125487	0.873095	401
80.7870	799.563	367	3.35381	1.10226	0.105101	0.754405	402
78.8408	799.400	337	3.26306	1.36312	0.108206	0.750458	403
80.4016	799.503	355	3.22256	1.28221	0.102117	0.727932	404
81.7778	799.582	402	3.46931	1.34924	0.105871	0.772101	405
79.8500	798.853	348	3.35397	0.991938	0.108098	0.762622	406
78.9041	798.563	329	3.72719	1.01928	0.123188	0.855340	407
79.4386	798.884	352	3.35841	1.00839	0.109255	0.766311	408
79.4297	797.088	333	3.93463	0.781063	0.128986	0.899974	409
79.8599	799.000	351	3.31258	0.990340	0.106832	0.753528	410
79.0752	797.728	341	3.07962	1.48817	0.101565	0.706128	411
81.6095	798.518	400	3.66919	1.13950	0.112822	0.818927	412
80.7929	799.691	383	3.01376	1.32181	9.407375E-02	0.676664	413
80.2028	799.029	360	2.83350	1.52545	9.024112E-02	0.641212	414
78.9476	798.739	353	3.40643	1.06690	0.112221	0.780933	415
79.3393	797.429	323	3.61762	1.10231	0.119295	0.829685	416
80.1468	799.402	333	3.92178	0.842853	0.125469	0.889178	417
81.0297	801.174	396	3.73822	1.00494	0.116000	0.838125	418
81.6006	799.081	387	3.53077	1.19918	0.108614	0.788375	419
81.3259	799.956	395	3.33634	1.19255	0.103000	0.746162	420

80.9031	799.877	383	3.90707	0.892679	0.121798	0.876991	421
79.4525	797.116	356	3.51893	1.06136	0.114809	0.803153	422
79.1000	799.123	334	3.42294	1.21876	0.112709	0.784874	423
80.0557	799.797	365	3.90291	0.752946	0.125135	0.886320	424
80.7325	800.227	357	3.61930	0.827314	0.113698	0.815333	425
79.3102	798.109	349	3.39280	1.01298	0.111081	0.775917	426
81.1044	800.533	379	3.51436	1.03728	0.109021	0.787695	427
79.9826	799.666	353	3.42264	1.06261	0.109786	0.777025	428
80.5106	800.060	357	3.30162	1.26881	0.104465	0.745740	429
79.1371	798.517	335	3.81234	0.953149	0.125401	0.873466	430
79.5594	797.859	347	3.41990	1.07876	0.111254	0.780061	431
78.9627	798.751	332	3.45416	1.30704	0.114161	0.792928	432
81.1996	799.258	385	3.41440	1.15035	0.106068	0.765407	433
80.6271	800.520	328	3.24655	1.13081	0.102682	0.733411	434
79.9134	798.978	355	3.35523	1.04274	0.108115	0.763061	435
80.1549	799.157	336	3.49024	0.996936	0.111891	0.792167	436
80.2205	798.433	365	3.52329	0.948676	0.112170	0.796915	437
79.9092	800.220	369	3.39665	0.989284	0.108834	0.770932	438
80.2168	799.198	382	3.32258	1.05154	0.105541	0.751089	439
79.0606	797.824	342	3.19696	1.17032	0.105193	0.732207	440
80.9116	799.543	367	3.38825	1.04690	0.106050	0.761964	441
79.0237	798.633	345	3.50422	1.14006	0.115551	0.803764	442
79.1092	797.623	335	3.14461	1.38932	0.103787	0.721226	443
81.5697	799.232	383	4.21192	0.784281	0.129487	0.940192	444
80.1923	798.471	378	3.38935	1.00555	0.108129	0.767427	445
79.7723	800.120	323	3.46071	0.970544	0.111960	0.788481	446
80.5023	798.414	361	3.37474	1.07381	0.106958	0.762267	447
79.1584	799.283	335	3.78945	1.04731	0.124584	0.868471	448
80.9848	800.521	386	3.37439	1.24823	0.105123	0.757635	449
79.8143	799.750	330	3.26945	1.22307	0.105548	0.744092	450
81.1679	800.819	382	3.36185	1.19536	0.104007	0.752755	451
81.7593	799.266	426	3.43656	1.28875	0.104783	0.764348	452
80.0595	799.027	357	3.76879	0.882970	0.120643	0.854660	453
79.8068	799.041	363	3.11964	1.30410	0.100660	0.709837	454
80.9588	799.804	381	3.27457	1.15915	0.102103	0.735234	455
79.3434	799.374	347	3.32436	1.20648	0.108688	0.760364	456
78.9267	800.047	311	3.53235	1.06849	0.116923	0.811798	457
78.8887	799.909	314	3.54055	1.42866	0.117488	0.814502	458
79.1966	798.074	341	3.23279	1.34848	0.106238	0.740335	459
79.5484	798.809	341	3.48758	0.921918	0.113301	0.795343	460
79.9355	798.879	356	3.50009	0.915136	0.112660	0.795589	461
79.5448	798.963	346	3.23527	1.20631	0.105172	0.738110	462
81.0851	799.063	388	3.92408	0.892786	0.122076	0.879978	463
80.9768	798.857	381	3.33640	1.17731	0.104479	0.750307	464
81.4429	800.487	372	3.81164	1.06601	0.117631	0.852794	465
79.4385	797.517	343	3.58697	1.02360	0.117274	0.819656	466
81.3308	800.586	385	3.70276	1.11763	0.114384	0.828684	467
81.0310	800.684	371	3.54268	1.30459	0.110166	0.794799	468
79.6134	799.041	333	3.46522	1.02784	0.112714	0.790920	469
78.7475	799.625	330	3.48838	1.21024	0.115724	0.802230	470
79.0905	799.542	356	3.74468	0.867944	0.122743	0.857099	471
78.7120	799.989	341	3.28717	1.24733	0.108945	0.755791	472
81.6363	799.599	400	3.60943	1.03404	0.110597	0.804778	473
79.2445	798.281	328	3.46092	1.19313	0.113879	0.793143	474
79.3903	798.797	367	3.17682	1.42168	0.103587	0.725598	475
79.6558	798.659	358	3.55010	1.07510	0.115057	0.808890	476
81.2648	801.893	398	3.50008	1.20489	0.107867	0.782929	477
79.2002	798.179	340	3.40821	1.05364	0.111930	0.780367	478
80.3517	800.132	382	3.18020	1.28707	0.100545	0.717853	479
79.2299	798.931	351	3.68218	0.988438	0.120240	0.841224	480
79.3474	799.410	338	3.50940	1.07175	0.114676	0.802413	481
79.2907	797.832	338	3.61943	1.29518	0.118836	0.828453	482
80.3695	799.702	371	3.94721	0.824005	0.125253	0.892442	483

80.6554	800.760	349	3.94831	0.803779	0.124404	0.890676	484
79.2522	799.895	344	3.37891	1.16644	0.110809	0.774079	485
81.4727	799.340	386	3.21776	1.45687	9.928988E-02	0.719420	486
80.3845	798.911	343	3.26233	1.18222	0.103644	0.737549	487
79.9768	799.515	359	3.58749	0.924636	0.115200	0.814954	488
81.2791	799.591	397	3.66608	1.07796	0.113404	0.820533	489
81.0803	800.646	385	3.39049	1.15636	0.105308	0.760469	490
80.0694	800.645	348	3.26363	1.27675	0.104382	0.740426	491
81.2979	800.465	376	3.37366	1.12937	0.104534	0.756077	492
80.9854	800.178	363	3.59515	1.12044	0.112249	0.807909	493
78.9428	799.643	355	3.61705	0.974909	0.118987	0.829096	494
79.0115	799.279	333	3.81745	0.851071	0.125639	0.874952	495
81.4317	798.331	406	3.66311	0.993203	0.113023	0.818486	496
81.0048	800.026	372	3.42858	1.18312	0.106611	0.768799	497
79.0539	798.444	325	3.43988	1.23858	0.113469	0.788877	498
79.0262	798.720	335	3.40804	1.12155	0.112346	0.781563	499
79.7364	797.962	339	3.60389	1.08535	0.117128	0.821964	500

average tau = 80.1321 sigma tau = 0.877687 average red chisq = 1.09949

average amp = 799.267 sigma amp = 1.00279

the squared ratio of sigma tau for the two data sets = 19.7766